

THE SPECIES OF THE GENUS NEOTEPHRITIS  
HENDEL IN AMERICA NORTH OF MEXICO  
(DIPTERA, TEPHRITIDAE)

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No previous attempt has ever been made to summarize information of the species comprising the New World genus *Neotephritis* Hendel. In the present paper I bring together the important taxonomic literature pertaining to *finalis* (Loew) and *inornata* (Coquillett), the species previously known to occur north of Mexico. I also present a short discussion of the host relationships of *finalis* and describe a new species, *rava*, at present known only from Arizona.

The following individuals furnished specimens for study: Marian Adachi, University of Arizona, Tucson; R. S. Beal, Jr., Arizona State University, Tempe; F. L. Blanc and P. H. Arnaud, Jr., California Department of Agriculture, Sacramento; R. R. Dreisbach, Midland, Michigan; B. A. Foote, University of Idaho, Moscow; R. C. Froeschner, Montana State College, Bozeman; A. T. McClay, University of California, Davis; R. L. Post, North Dakota Agricultural College, Fargo; H. G. Rodeck, University of Colorado Museum, Boulder; C. W. Sabrosky, U. S. Department of Agriculture, Washington, D. C.; and G. Wallace, Carnegie Museum, Pittsburgh, Pa. Collections in the U. S. National Museum are also included in this study.

Genus *Neotephritis* Hendel

*Neotephritis* Hendel, 1935, *Konowia* 14: 54. Type-species: *Trypeta finalis* Loew, 1862; by original designation.

GENERIC DIAGNOSIS.—Three pairs lower fronto-orbitals; two pairs upper fronto-orbitals, the posterior pair reclinate, not convergent; ocellars at least as long as posterior lower fronto-orbitals. No presutural dorsocentrals; one pair postsutural dorsocentrals, situated closer to transverse suture than to supra-alars; two pairs scutellars. Wing pattern primarily a dark field with rounded hyaline or yellowish-hyaline spots, those immediately distad of stigma close together and forming an inverted triangular area extending from costa to vein  $R_5$ ; vein  $R_5$  bare at node and beyond.

DISCUSSION.—The genus *Neotephritis* is closely allied morphologically to the following seven genera, all comprising the typical tribe of the subfamily Tephritinae: *Euarestoides* Foote, *Euaresta* Loew, *Tephritis* Latreille, *Paroxyna* Hendel, *Oxya* Robineau-Desvoidy, *Trupanea* Guettard, and *Dyseuaresta* Hendel. Of these genera, *Euarestoides*, which has three pairs of lower fronto-orbitals, two pairs of upper fronto-orbitals, and two pairs of scutellars, is perhaps most closely related to *Neotephritis*. The two genera may be differentiated by the wing pattern, that of *Euarestoides* having a combination of the dark pre-apical starlike pattern typical of *Trupanea* and lighter basal wing field markings, and that of *Neotephritis* with hyaline spots scattered over a dark field. *Euaresta*, *Tephritis*, and *Paroxyna*, all having hyaline spots in a dark field, may be distinguished by the presence of only two pairs of lower fronto-orbitals, and *Oxya* by the presence of only one pair. *Trupanea* and *Dyseuaresta* have only one pair of scutellars.

With the unaided eye, species of *Neotephritis* can be recognized by the large, inverted hyaline triangle based on the costa at the middle of the wing, on each side of which is an oblique dark area. These dark marks have the gross appearance of a Y, with the triangle situated between its arms. This Y mark and hyaline triangle are less evident upon magnification, however, because of the presence of other hyaline spots in the wing disc.

Key to the Species of *Neotephritis* Occurring North of Mexico

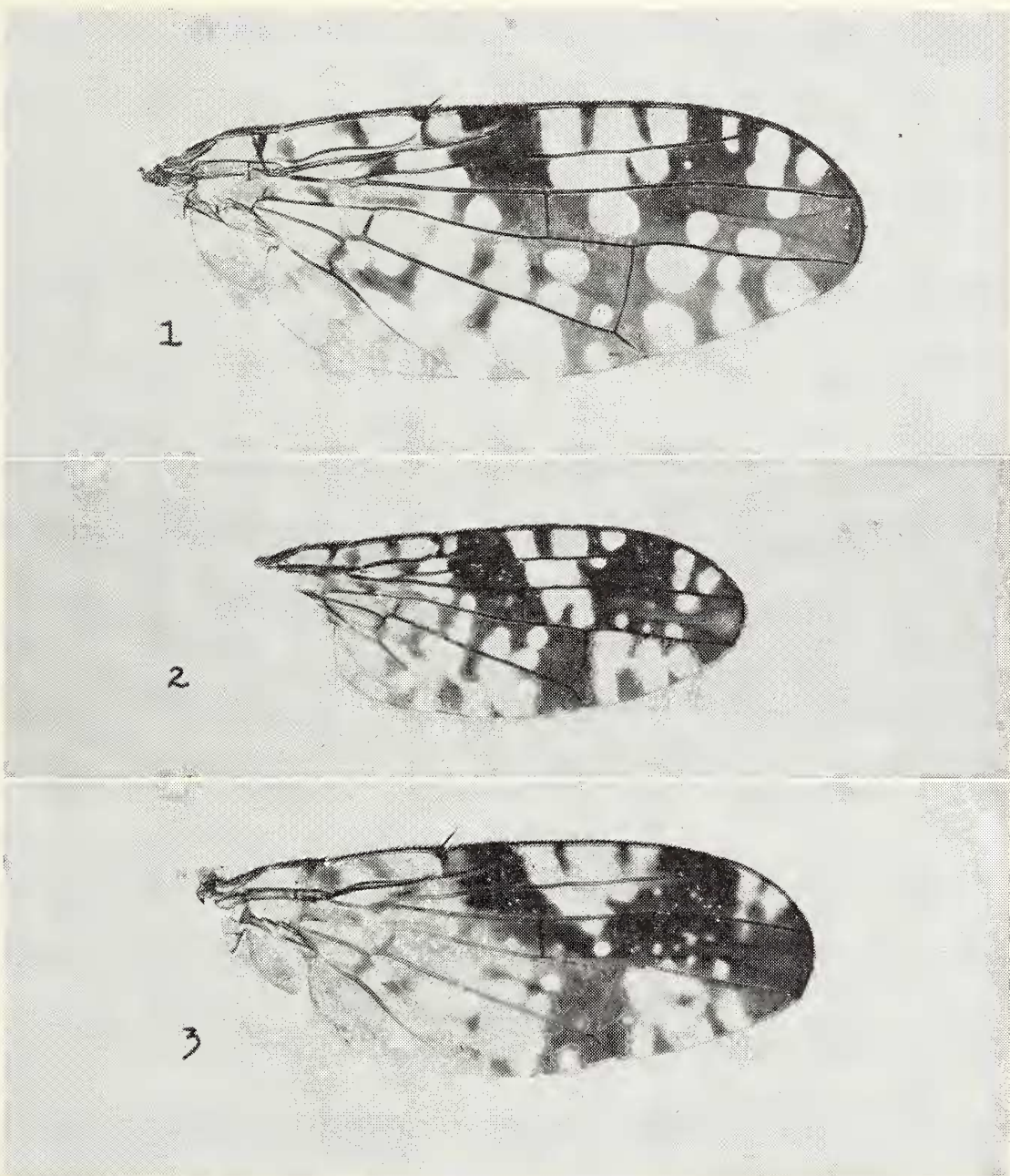
1. Two light spots in cell  $R_5$  immediately anterior to vein  $M_{1+2}$ ; ovipositor sheath darkened at apex ..... **finalis** (Lw.)  
 Three to five light spots in cell  $R_5$  immediately anterior to vein  $M_{1+2}$ ; ovipositor sheath darkened only at base or unicolorous ..... 2
2. Mesonotum and abdominal terga grayish; flattened ovipositor sheath about 1.5 times as long as width at base; wing grayish, hyaline spots with distinct margins ..... **inornata** (Coq.)  
 Mesonotum and abdominal tergites gray with a distinct yellow cast; ovipositor sheath not longer than width at base; hyaline spots of light brown wing with indistinct margins ..... **rava**, new species

*Neotephritis finalis* (Loew)

(Fig. 1)

*Trypeta finalis* Loew, 1862, Berl. Ent. Ztschr. 6: 222; 1864, Cent. II: 92. Loew, 1873, Smithsn. Misc. Collect. 11(256): 296; pl. XI, fig. 4.

*Tephritis finalis*: Loew, 1873, Smithsn. Misc. Collect. 11(256): 297, 330. Snow, 1894, Kans. Univ. Quart. 2: 172. Doane, 1899, Jour. N. Y. Ent. Soc. 7: 188. Coquillett, 1899, Jour. N. Y. Ent. Soc. 7: 264. Johnson, 1903, Trans. Amer. Ent. Soc. 29: 106. Snow, 1903, Kans. Univ. Sci. Bul. 2: 219. Snow, 1904, Kans. Univ. Sci. Bul. 2: 345. Aldrich, 1905, Smithsn. Misc. Collect. 46(1444): 611. Cresson, 1907, Trans. Amer. Ent. Soc. 33: 101. Cole and Lovett, 1921, Proc. Calif. Acad. Sci., 4th Ser., 11: 326. Janes and Thomas, 1932, Utah



RIGHT WING, DORSAL VIEW. Fig. 1, *Neotephritis finalis* (Lw.); fig. 2, *N. inornata* (Coq.); fig. 3, *N. rava*, new species.

- Acad. Sci. 9: 104. Bissell, 1936, Gardeners' Chron. Amer. 40: 233. Phillips, 1946, Amer. Ent. Soc., Mem. 12: 79, 123; pl. IV, fig. 34; pl. VII, fig. 78; pl. XI, fig. 143.
- Trypeta (Tephritis) finalis*: Osten Sacken, 1877, Bul. U. S. Geol. and Geogr. Surv. 3(2): 346. Osten Sacken, 1878, Smithsn. Misc. Collect. 16(270): 193.
- Euribia finalis*: Hendel, 1914, Arb. Berl. Mus. Dresden 14(3): 67. Aczél, 1949, Acta Zool. Lilloana 7: 184.
- Neotephritis finalis*: Hendel, 1935, Konowia 14: 54. Quisenberry, 1951, Jour. Kans. Ent. Soc. 24: 59. Aczél, 1951, Acta Zool. Lilloana 12: 119.
- Tephritis affinis* Snow, 1894, Kans. Univ. Quart. 2: 172; pl. VII, fig. 12. Coquillett, 1899, Jour. N. Y. Ent. Soc. 7: 264. Aldrich, 1905, Smithsn. Misc. Collect. 46(1444): 611. Quisenberry, 1951, Jour. Kans. Ent. Soc. 24: 59 (syn.).

MATERIAL EXAMINED.—Types (♂ and ♀ on one pin) with the following labels: "Cala.," "Loew Coll.," "finalis Lw.," and "Type 13314." In the Museum of Comparative Zoology, Cambridge, Mass. Over 1,000 specimens from about 175 localities were examined for this study. The data below summarize the distribution of *finalis* and indicate for each state the inclusive dates of capture, regardless of year, and the inclusive years in which the dates for each state occurred. ARIZONA: 2.II to 4.XI, 1911–1958. CALIFORNIA: 1.III to 29.VII, 1916–1955. COLORADO: 24.IV to 27.IX, 1900–1952. GEORGIA: 9.VII to 19.X, 1935–1936. IDAHO: 6.IV to 3.X, 1925–1953. KANSAS: 13.IX to 13.X, 1930–1934. MISSOURI: 26.VIII to 18.X, 1927–1938. MONTANA: 29.IV to VIII, 1933–1956. NEBRASKA: 29.VI to 2.IX, 1904–1958. NEVADA: 12 to 17.VII, 1911. NEW MEXICO: 25.VII to 29.VIII, 1894–1952. NORTH DAKOTA: 24.VIII, 1924. OREGON: 4.VI to 8.VIII, 1897–1950. SOUTH CAROLINA: 1932. SOUTH DAKOTA: no data. TEXAS: 18.III to 19.IX, 1905–1958. UTAH: 24.V to 14.VIII, 1911–1956. VIRGINIA: 1930. WASHINGTON: 30.III to 3.IX, 1901–1947. WYOMING: 20.VI to 22.VII, 1895–1941.

Hosts. Bissell (1936) describes an infestation by *finalis* of dahlias grown in a 1935 trial planting at the Georgia Experiment Station. The flies were seen laying eggs between the sepals and petals just as the flowers were beginning to open. The larvae worked down through the petals and congregated on the disc,

where they caused rapid destruction of the ovaries and other flower parts. No mention is made of seed infestation, but seed production must have been affected seriously.

*N. finalis* has been reared in Oregon from *Eriophyllum lanatum* (Cole & Lovett, 1921), in Utah from seeds of *Helianthella uniflora*, and in Texas from seeds of a plant doubtfully identified as *Actinomeris* sp. Phillips (1946) has called it the sunflower maggot because of its predilection for that plant; adults have been reared from heads of various species of *Helianthus* in many parts of the United States.

Adults have been collected from a number of plants: *Artemisia tridentata*, *Baccharis sarothamnae*, *Cirsium* sp., *Encelia californica*, *Englemannia pinnatifolia*, *Lupinus* sp., *Prunus virginiana*, *Salsola parviflora*, *S. pestifer*, *Solanum eleagnifolium*, *Valciana edulis*, and *Wyethia angustifolia*. They have also been found on artichoke, corn, cotton, alfalfa, peaches, potatoes, and spinach.

DISCUSSION. *N. finalis* is one of the most commonly encountered tephritids in North America. It is easily distinguished from the following two species by the presence of only two round hyaline spots in cell  $R_5$  immediately anterior to vein  $M_{1+2}$ , and by the longer ovipositor sheath which is about half again as long as its width at the base and always and distinctly darkened at its tip. *N. finalis* resembles *inornata* closely except for its larger size and the characters discussed under the latter species. For characters distinguishing *finalis* from *rava*, n.sp., see the discussion of that species.

*Neotephritis inornata* (Coquillett)

(Fig. 2)

*Tephritis inornata* Coquillett, 1902, Jour. N. Y. Ent. Soc. 10: 181. Aldrich, 1905, Smithsn. Misc. Collect. 46(1444): 612. Cresson, 1907, Trans. Amer. Ent. Soc. 32: 104; pl. I, fig. 5. *Neotephritis inornata*: Quisenberry, 1951, Jour. Kans. Ent. Soc. 24: 59.

MATERIAL EXAMINED. Holotype male with the following labels: "Las Vegas H. S., N. M., 2-VIII," "H. S. Barber, Collector," "Type No. 6638, U.S.N.M." [in red], and "*Tephritis inornata* Coq." In the U. S. National Museum, Washington. ARIZONA: 1 ♀, Chiricahua Mts., 9.VIII.58; 1 ♀, Huachuca Mts., 30.X.37;

2 ♂♂, 4 ♀♀, Portal, 7.VIII.58; 6 ♂♂, 3 ♀♀, 5 mi. W. of Portal, 13.VIII.58; 1 ♂, Rustler Park 6.VIII.58. COLORADO: 1 ♀, Colorado Springs, 5915 ft. alt., VIII.08; Ft. Collins, 19.VIII.06 (1 ♀) and 11.VIII.34 (♂, 2 ♀♀); 1 ♂, "University Campus." NEW MEXICO: 1 ♀, Cline's Corners, Albuquerque, 25.VIII.40; Las Vegas Hot Springs, 5.VIII (1 ♀) and 9.VIII (1 ♀); 1 ♂, Raton.

HOSTS. No information available.

DISCUSSION. Coquillett's description (1902, p. 181) of this small, rare species depends upon wing characters to distinguish it from *finalis*. In nearly all specimens of *inornata* I have seen, a small hyaline area of varying extent is present near the apex of the stigma (see fig. 2), and without exception cell  $R_5$  contains three small hyaline spots in a row immediately anterior to vein  $M_{1+2}$ . All hyaline spots tend to have less distinct margins than those of *finalis*, and the spots forming the hyaline triangle immediately distad of the stigma are much more closely fused than in that species. The body color of *inornata* is darker gray with less yellow, and the ovipositor sheath, although of about the same proportions as that of *finalis*, is brownish yellow and darkened basally but not apically. Adults of *inornata* are usually smaller than those of *finalis*, but an occasional female may be comparable in size with an average *finalis* male. For characters distinguishing *inornata* from *rava*, n.sp., see the discussion of that species.

***Neotephritis rava*, new species**

(Fig. 3)

A large *Neotephritis*, comparable in size to *finalis* (Lw.), having brownish wings with indistinctly margined hyaline spots and a short, yellow, unmarked ovipositor sheath.

HEAD. Frons brownish yellow, as wide as distance from occiput to lunule, at occiput 1.2 times as wide as one eye; parafrontal with silvery-white pollen in certain lights; in profile face concave immediately above oral margin; eye 1.2 times as high as wide; cheek 0.12 times as high as eye; antenna yellowish with short black hairs; lower fronto-orbital, anterior upper fronto-orbital, ocellar, and vertical dark brown to black; posterior upper fronto-orbital, ocular, and genal pale brown to brownish yellow.

THORAX. Sternopleuron and metanotum dark gray with thin golden pollinosity; humeri, mesonotum and scutellum so heavily golden pollinose that the black ground color is almost completely obscured; entire thorax, especially mesonotum and lateral borders of scutellum, with short, blunt, yellowish hairs in addition to the longer dark brown to black bristles. Legs brownish yellow with thinly scattered gray to silver pollinosity, appearing almost as a bloom; bristles dark brown or black. Halter yellow.

Dark marking of wing as in fig. 3, definitely brown with pattern of hyaline spots typical of the genus; hyaline areas with quite indistinct margins; most hyaline areas distinctly yellowish and represented by fused spots containing various degrees of brown color; basal two-thirds to three-fourths of cell 1st  $M_2$  almost completely yellowish hyaline because of the presence of two rows of fused spots; proportion of length to width of stigma as 13:5; dark areas in cells  $R_3$  and  $R_5$  with numerous, very small, yellowish hyaline spots.

ABDOMEN. Tergites grayish yellow, subshining, without pattern, covered with black hairs; sternites subshining but with denser gray pollinosity than tergites. Ovipositor sheath shining brownish yellow, completely covered with short, black hairs, flattened sheath almost exactly as long as width at base. Male terminalia shining brownish yellow.

TYPES. Holotype female, Rustler Park, Portal, Arizona, alt. 8200 ft., 3.VIII.55, R. R. Dreisbach. U. S. National Museum Type No. 64827. Paratypes (all Arizona): 3 ♂♂, 2 ♀♀, same data as type (1 ♂, 1 ♀, U. S. National Museum; 2 ♂♂ 1 ♀, Dreisbach Collection); Chiricahua Mts., 12.VIII.37 (1 ♀, Univ. Arizona, Tucson); 7.VIII.55 (1 ♂, 2 ♀♀, U. S. National Museum; 2 ♂♂, 6 ♀♀, Univ. Arizona, Tucson); 1 ♀, 5 mi. W. of Portal, Cochise Co., 28.VIII.57 (Univ. Arizona, Tucson); 2 ♂♂ Rustler Park, 25.VI.53 (U. S. National Museum); Santa Rita Mts., 15.VI.24 (1 ♀, Univ. Arizona, Tucson); 25.X.36 (1 ♀, Calif. Acad. Sci., San Francisco).

HOSTS. No information available.

DISCUSSION. *Neotephritis rava* may be distinguished easily from *finalis* by the yellowish gray color of the body, the brown color of the dark areas of the wing disc and the yellow cast of the hyaline areas, and the shorter, unicolorous ovipositor sheath. Unlike the preceding two species, the hyaline spots in the wing of *rava* are indistinct and tend to fuse with each other in areas where they are close together. The dark areas of cells  $R_3$  and  $R_5$  contain numerous small hyaline spots; these are not present in the other two species of the genus.

#### Literature Cited

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- PHILLIPS, V. T., 1946. The biology and identification of trypetid larvae. *Amer. Ent. Soc., Mem. No.* 12, 161 pp.; illus.